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ABSTRACT

This paper describes an approach to meeting the needs of college students with learning disabilities which utilizes Internet resources in an undergraduate introductory psychology course. The course's Web resources were designed to integrate the lecture component of the course with the accompanying textbook resources. These resources included lecture outlines, links to library resources, related campus resources, sample exams, instructor based resources, relevant World Wide Web links, chapter outlines, concept synopses, graphs and figures, definitions of key terms, links to related concepts in other chapters, sample test questions, access points to Web based tutorials, and additional commentary. Evaluation through surveys of 227 students over three academic quarters found the course Web resources were widely used and rated highly by students. Students reporting known or suspected learning disabilities found the Web resources even more helpful and used them more heavily than other students. Discussion focuses on the characteristics of the course's Web resource platform, which contributed to its perceived success for students with learning disabilities. (DB)

Utility of Course Web Resources for Students with Learning Disabilities¹

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Abstract

One way to cope with the unprecedented influx of college students with learning disabilities is to develop individual course management tools that are designed for all students but would be especially helpful for students with learning disabilities. An example of this approach capitalizes on the common medium of the internet to provide 24 hour access to web resources which support an introductory psychology class. In addition to wide use and high evaluations by students in general, these resources were more heavily used by students with learning disabilities. Compared to students who did not report a learning disability, these students rated the usefulness of the resources more highly, and believed that the resources gave them more control over their course work.

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¹ Paper Presented at the 109th Annual Convention of the American Psychological Association. August, 27, 2001, San Francisco, California.

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One way to cope with the unprecedented influx of college students with learning disabilities is to develop individual course management tools that are designed for all students but would be especially helpful for students with learning disabilities. An example of this approach capitalizes on the common medium of the internet to provide 24 hour access to web resources which support an introductory psychology class. In addition to wide use and high evaluations by students in general, these resources were more heavily used by students with learning disabilities. Compared to students who did not report a learning disability, these students rated the usefulness of the resources more highly, and believed that the resources gave them more control over their course work.

According to a 1999 study by the American Council on Education, students with learning disorders are attending college in unprecedented numbers (Henderson, 1999). In fact, as many as four percent of college students and 10 percent of adults nationwide suffer from a learning disorder (American Psychiatric Association, 1994). Although recent research has explored the usefulness of assistive technologies for learning disabled students (e.g. speech recognition software, computerized text readers, etc.) few studies have investigated the utility of web-based course support materials (Raskind and Higgins, 1998). Given the nature of college-level instruction, a significant challenge

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to universities is to develop and provide effective resources to assist these students in achieving their academic goals.

Traditionally, "extra-course" assistance, e.g. note takers, books on tape, tutors, etc. have been used to help students master course content. Another strategy is to develop general course management tools that are designed to help all students master the course material, but would be especially useful for students with learning disabilities. The emerging use of the World Wide Web offers a common medium providing students with 24 hour access to such resources. One example of this approach as it pertains to students with learning disabilities can be seen in the implementation of supporting web resources for a large introductory psychology course.

The course web resources were designed to integrate the lecture component of the introductory course with the accompanying textbook resources. Special design considerations were made for simplicity, functionality, and a student oriented perspective that linked course resources with student goals. The lecture component of the course web resources contained lecture outlines, links to library resources, related campus resources, sample exams, instructor based resources, and relevant World Wide Web links. The text book component included chapter outlines, concept synopses, graphs and figures, definitions of key terms, links to related concepts in other chapters, sample test questions, World Wide Web sites, access points to web based tutorials, and additional commentary. Students could seamlessly navigate from the instructor developed lecture resources to the supporting textbook resources. A particular topic covered in the lecture portion of the course was linked to the web resources developed

to support the textbook's treatment of the same topic. supporting resources, e.g. sample test questions, links to library components, etc. were also conveniently linked to the text and lecture components.

While not designed specifically for students with learning disabilities, it is possible that the highly integrated structure and content of these web resources could provide students with learning disabilities an additional tool to master course concepts. It was predicted that compared to students who did not report any known or suspected learning disabilities, students with learning disabilities would report more frequent use of the web resources and more highly rate the utility of the web resources. In addition, these students were predicted to more likely believe that the web resources gave them more personal control over the course, increased their learning, and enhanced their educational experience.

Method

Routine surveys evaluating the web resources surveys were administered to 240 students during Fall Quarter, 1999, and Winter Quarter, 2000. In addition to the standard evaluation questions, students were asked if they knew or suspected they had some sort of learning disability. On a six point scale, the degree of severity ranged from "very minor and does not affect my college performance" to "a significant disruption that may force me to leave the university." Other questions included a rating of increased personal control, increased learning, and the belief that web pages would enhance their educational experience ("strongly agree" to "strongly disagree").

Results

Of the 227 students responding to the survey question, 54 (25.8%) reported a suspected or known learning disability (Table 1).

Table 1
Perceived Severity of Learning Disability in Respondents Indicating a Learning Disability (n = 53)

Number	Percentage	Perceived Severity
12	22.2	"Very Minor and does not affect college performance."
20	37.0	"A disruption that requires extra effort in some classes but does not affect my overall performance."
10	18.5	"A significant disruption that requires great effort to get the grades I want."
9	16.7	"A significant disruption that has forced me to settle for grades that are lower than I know I am capable of."
2	3.7	"A significant disruption that may force me to leave Cal Poly."

Table 2 summarizes use patterns of the students enrolled in the introductory course. The web resources were used to some degree by over 95% of the students.

Table 2
Use Patterns of Web Resources in Percentages

Usage	Total Percentage of Respondents	Learning Disabled Respondents	Non-Learning Disabled Respondents
Heavy	25.6	39.6	22.1
Moderate	43.2	43.4	44.8
Light	28.6	17.0	30.5
Little/None	2.6	0.0	2.6

N = 240

While approximately 67% of the students who did not report learning disabilities were heavy or moderate users, 83% of the students reporting learning disabilities reported heavy or moderate use. Table 3 Summarizes the differences between the two groups on rating items.

Table 3
Summary of the Differences Between Learning Disabled and Non-Learning Disabled

Item	Mean of LD	Mean of Non-LD	DF	t value	Prob.
Usefulness	1.75	2.13	190	3.26	.001
Increased Control	1.72	2.06	102	2.59	.01
Increased Learning	1.83	2.02	102	1.28	.20
Enhanced Educ.	1.69	1.89	102	1.96	.12

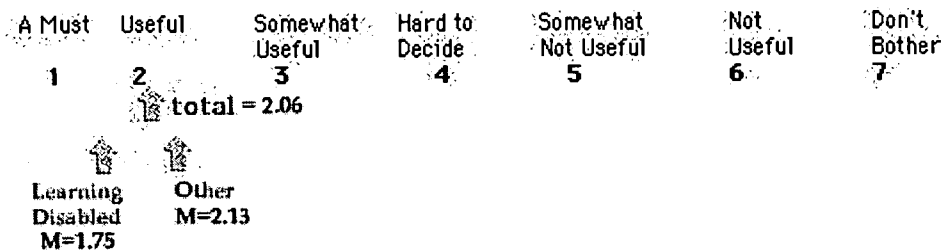
N = 240

Note. LD = learning disabled respondents.

The students reporting learning disabilities significantly used the web resources more heavily than the other students ($z = -2.9$ [corrected for ties] $p = .004$, Mann-Whitney nonparametric test). On a seven point scale rating usefulness (Figure 1), students in general rated the web resources as being useful, mean = 2.06.

Figure 1
Overall Usefulness Rating

Section I OVERALL USEFULNESS OF THE WEB RESOURCES FOR THIS CLASS (circle one)



In comparing the students who identified themselves as having a known or suspected learning disability versus those who did not, the learning disabled students rated the usefulness of the web resources significantly higher, $t=3.26$, $df=190$, $p<.001$.

Most students generally agreed that the web resources increased their sense of control, increased their learning of course material, and enhanced their education. The group identified as possessing some learning disability reported significantly stronger agreement with a sense of increased control, $t=2.59$, $df\ 204$, $p<.01$. There were no significant relationships between perceived severity and any other variable.

Discussion

The course web resources were widely used and rated highly by students. This supports the notion that well designed and task relevant web resources will be perceived as helpful by students in general. As predicted, students reporting known or suspected learning disabilities found the web resources even more helpful and used them more heavily.

There may be a concern that because of their information processing deficits, learning-disabled students would be less likely to use computer and web-based course support systems. This is not likely the case in general, as research by Suthakaran and Sedlacek (1999) found that learning disabled students were just as efficacious in their computer use as their non-disabled peers.

It is speculated that in addition to the underlying model which drove the overall logic and design of the web resource platform, there may be specific characteristics that are key to their perceived success by students with learning disabilities:

- The structure of the web resources is highly organized and mirrors the organization of the course.
- Key concepts are clearly identified and concisely explained in small, more manageable chunks within the context of the actual text structure.
- There are multiple interactive sample examinations that not only identify the most likely concepts to be tested in the format in which they will be tested, but also have interactive links back to the appropriate text material.
- The platform is organized so that relevant resources are immediately accessible when the student is likely to need them.

It must be pointed out that the web resources described here are not similar to the current web course management platforms offered by most universities or the major publishers. Those platforms appear to be designed for efficient data storage rather than flexible and interactive web tools. Their organization is not set up to closely mirror the course, and it is not clear that they would provide the kind of assistance the web resources described in this study offered. Greater attention to the needs of students and course goals is necessary to fulfill the potential of web based learning tools.

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